iPads: What are we learning?

Summary Report of Provincial Data Gathering Day - October 3, 2011

Alberta

Government of Alberta

iPads: What are we learning?

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Alberta Education's School Technology Sector is to monitor emerging technologies and to support students and the department as a whole in understanding how technology can enable learning and teaching.

Following Apple Inc.'s April 2010 introduction of the iPad, School Technology began to hear about these devices being used in Alberta classrooms - not in one and twos but in large numbers. As part of the sector's continuing efforts to monitor emerging technologies in schools, school authorities implementing iPads were invited to send representatives to a one-day event to discuss the opportunities, emerging lessons learned and challenges presented by implementation of iPads into Alberta classrooms.

On October 3, 2011, 147 participants, representing 25 school authorities, met in Edmonton to explore these questions:

- Why iPads? What goals influenced your decision to implement iPads?
- How are you currently using iPads in your classroom, school or school authority?
- What early indicators of success are you observing?
- What challenges have you encountered along the way? How are you addressing these challenges?

The following summary is not intended to promote or encourage any type of pedagogical or technological approach; rather its intent is to reflect what was heard.

The Stage

Over the last 10 years in Alberta much work has been done to address three core areas of technology in education: infrastructure (hardware and software), curriculum and resources and professional learning. Several large-scale provincially funded projects, such as the Alberta SuperNet, LearnAlberta.ca, provincial videoconferencing, Innovative Classrooms Funding and the Provincial Microsoft License (Alberta Education, 2007b), have provided schools with access to broadband, resources and applications. In terms of curriculum and resources, Alberta's ICT and Career and Technology Studies curriculum, along with the Teaching Quality Standard, place an expectation on teachers to apply a variety of technologies to meet the mandated learning outcomes across the curriculum, within specific courses of study in junior and senior high school and generally to meet the students' diverse learning needs. In 2009, the Principal Quality Practice Guideline was revised to include a technology leadership dimension requiring principals to "recognize(s) the potential of new and emerging technologies, and enable(s) their meaningful integration in support of teaching and learning" (Alberta Education, 2009, p.5). And most recently the Framework for Student Learning identifies the key competencies of an educated Albertan, including an emphasis on digital and technological fluency. Through this bold technology agenda Alberta has earned an international reputation as a system at the forefront of technology and education.

Most recently, the 21st Century learning discourse which demands a shift from the industrial age education model to a learner-centered, inquiry-based design is fueling a need to re-imagine some of the pillars of public education such as standardized assessment, whole group instruction and subject-specific learning (Alberta Education, Inspiring Education, 2010). In addition, the Action on Inclusion initiative, which set out to "provide all students with the most appropriate learning environments and opportunities for them to best achieve their potential", creates more demand for technology to differentiate instruction (Alberta Education, 2011). Increasingly, educational leaders, stakeholders and the general public are recognizing technology could be better utilized to improve and enhance learning experiences for students. This unrealized potential, coupled with the realities of our digital landscape and a growing sense

schooling is falling out of step with today's youth (Canadian Education Association, 2011), is sharpening the focus on classroom technologies.

iPads enter the education scene in Alberta against this backdrop of initiatives, lessons learned and pockets of innovation. It is important to highlight the challenges hindering systemic change because while it is indeed early days, iPads appear to be effectively mitigating some of them. iPads eradicate many of the access issues, reduce the need for teacher expertise and provide evidence of enhanced learning almost instantly. As with any new technology, there are challenges and mismatches in the classroom. iPads are designed to create an intensely personal experience. This orientation can be out of step with the current realities of the classroom. Thus, while school jurisdictions have traditionally planned and supported technology within an enterprise environment, iPads present as a square peg. iPads not only run in contrast to our more systemic ways of planning for technology integration but they also offer a new way of interacting with content. As one participant noted, iPads are not laptops or desktops and thus compel us to adopt other ways of thinking. *"The touch interface seems to connect students to content differently; the ways to get to learning is different"* (Roundtable participant).

Enter iPads

From the moment iPads were introduced, technology writers began making what sounded like wild predictions of uptake in the mass market. As Levy writes, while most of those in attendance at the launch knew the basic design and affordances of the iPad, Steve Jobs astounded everyone in the room by demonstrating how this device would be a paradigm breaker, and begin "blazing a path to the future of computing" (Levy, 2010). The sales figures are testament to the seemingly universal appeal of iPads. While some have characterized iPads as individual media consumption devices, others suggest iPads are ushering in a new generation of computing as they "rely on new input and output methods, and allow a new population of non-expert users to use the product more cheaply and simply" (Dedui, as quoted in Arthur & Fox, 2011).

School jurisdictions were not immune to the iPad buzz and while there is still little scholarship on the effectiveness of iPads for learning and teaching, iPads are becoming more prevalent in classrooms and at a much faster rate than previous technology. Alberta Education responded to the activity across the education system by inviting those currently implementing iPads in schools to participate in a knowledge gathering and sharing event. *iPads - What are we learning?* was held on October 3, 2011, 27 and school authorities along with educational leaders from stakeholder organizations gathered to share their experiences. Prior to the event, registered participants shared their top three reasons for using iPads were to support students with unique learning needs; to meet the needs of every student, every day in keeping with Universal Design for Learning (UDL) principles; and to increase student engagement. These three reasons share a common thread of personalization and reflect a need to shift from industrial/mass models of education to a more customized, relevant orientation to learning.

Top three reasons shared for using iPads:

1. To support students with unique learning needs;
2. To meet the needs of every student every day in keeping with Universal Design for Learning (UDL) principles; and
3. To increase student engagement.

This report outlines the knowledge gleaned from the group relative to the three key themes emerging from the panelists, roundtable discussions and Twitter feed. Overall, the data gathered indicates that while many teachers, schools and school authorities are struggling with implementation challenges, there is also strong recognition that iPads excel in three areas – improving engagement, supporting multiple ways to access the curriculum (Universal Design for Learning) and enhancing assessment practices. Along with these educational benefits come some technical issues and barriers, such as device management (deployment), financing (applications[1] and equipment) and proprietary limitations. Additionally, as learned from implementations in the past, iPads make a positive difference in classrooms and schools when they are used in pedagogically sounds ways and technical support is in place to capitalize on the learning benefits.

iPads excel in three areas:

1. Improving engagement;
2. Supporting multiple ways to access the curriculum (UDL); and
3. Enhancing assessment practices.

[1] An application or apps are software specifically made for mobile devices, including smart phones and tablets that run on a less robust operating system.

The Experiences

Ready: Improving Engagement

Participants underscored the increased engagement iPads generated throughout the school community. As one presenter explained:

> *In just a few weeks, we have seen success in increased engagement in Grades 4 to 6 and as an instructional leader, I've seen success in moving pedagogy forward in classes. Teachers are also excited and engaged. [iPads are] opening up the work to the world…not just working for teachers but for a whole learning community. The presentation element is moving us forward. [We are] changing the conformation of the school so there are presentation spaces all over the school. Parents are very responsive…[they] want students to bring iPads home and see what/how they are learning.*

While the marketing of the product certainly contributed to the interest and increased uptake in schools, participants also noted iPads capture the imagination and generate *"such a sense of excitement and possibility. The momentum came from the ground up, this is about learning rather than the tool"* (Panelist). Many participants pointed to the interface, or perhaps more correctly the invisibility of the interface, as a primary motivating factor. *"Even if the excitement dies down a bit, the touch interface is still more engaging and easy to use than paper or regular computers"* (roundtable participant). Two teachers presented a video of Grade 8 students using a 3D perspectives app of Florence called Firenze.[2] While

> *
> *Are we helping teachers moving beyond skill/drill 'glorified Number Munchers' apps to put outcomes first, app choice last?*

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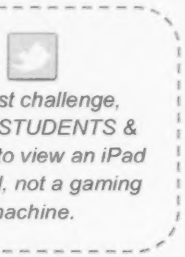
* this symbol indicates a comment made on Twitter during the event

the app contained information on the region similar to a book or website, the kinesthetic virtual reality type experience added a meaningful dimension to the context. Students were physically engaged and, one could observe, more intellectually curious about the subject.

Participants shared that iPads had a very short learning curve operationally speaking, which essentially erased the lag time between powering up and going to work. The touch interface coupled with the intuitive functionality of the device empowers teachers and students and creates a sense of 'what if' or wonder about the potential applications. The iPad appears to extend opportunities for playfulness to users of all ages. In their article on Deep-Play, Koehler et al (2011) talk about four key characteristics or attributes of play including: 1). Play is voluntary and not externally imposed; (2). It is internally motivating; (3). It involves significant levels of engagement; and (4). It has a make-believe quality that is significantly different than other activities people engage in. The portability, interface and multimedia features of the iPad are inviting to users in new ways.



In considering the quality of student and teacher engagement, participants cautioned that iPads can also be used to foster low levels of cognitive engagement effectively digitizing drill-based learning. Others suggested the high level of interest in iPads is too much about the 'play' factor.

So while many educators currently implementing iPads agreed, "Student engagement is the #1 benefit", there was also a recognized need to be discerning about the how (e.g. app selection) and why (e.g. learning goals) of iPad implementation. Overall, participants felt the joy of learning, the inspiration and the sense of possibility fostered by iPads in the classroom has been a significant return on their investment. In light of evidence on student engagement, (Willms, J.D., Friesen, S. & Milton, P. 2009), iPads do enhance the affective dimension of learning experiences and this cannot be discounted. Research-based, pedagogically sound frameworks were

Research-based pedagogically sound frameworks were often mentioned by participants discussing the need to ground iPad adoption in what we already know about effective teaching and learning with technology.

[2] Virtual History – Firenze is an interactive book that transports a reader back in time. Italian publisher Mondadori covers the Florentine Renaissance and all that led up to it with astonishing breadth and scope. Read more: http://www.148apps.com/reviews/firenze-virtual-history-review/#ixzz1dWArt0SL

often mentioned by participants discussing the need to ground iPad adoption in what is already known about effective teaching and learning with technology.

In conclusion, participants expressed common experiences with increased engagement during the implementation of iPads in the classroom. Broadly speaking, those involved in technology integration for many years agreed iPads have been welcomed, rather than resisted or neutrally accepted, by teachers in their school authorities. Where previously introduced technologies, such a laptops, have certainly made a positive difference for student learning especially in whole class instruction settings, iPads by virtue of their intensely personalized design meet individual needs.

Set: Multiple Means to Learning

Participants underscored the iPad's utility relative to creating multiple ways for students to access learning. iPads, both through their interface alone and their apps specifically, offer rich multimedia-based ways of accessing and interacting with content. Many of the participants pointed to highly specific uses of iPads. *"The devices have proved especially beneficial for dyslexic pupils, who are able to increase the font size for texts to de-clutter their vision"* (Participant). Teachers are reporting students, who in the past have been frustrated by a text-based program, are less frustrated as they are given opportunities to participate in other ways. "[Some students are] *visually literate although not in reading and writing so this device motivates them to be more engaged in writing process [through apps like] Photo Pad, Story Kit, StoryPatch and Proloquo2go."* Another participant discussed how visually impaired students can 'see' color using Listen At It. The app is a *"tool to help you hear what your camera is looking at. When you touch the screen... the app will take a photo using the back camera, then you can move your fingers around to hear sound representing color of the point of touch. The frequency of the whistle represents color" (Fu, 2011).*

Other participants noted the physical elements of iPads enable easy portability and facilitate gesture-based approaches to interactivity more readily. While assistive technologies have been

demonstrating benefits for student learning for years (Edyburn, D.L., 2006), iPads have an inherent 'cool' factor which makes them especially attractive for all students. Participants are noticing iPads level the playing field while at the same time ensuring *"special needs students can use the same tool as other students."*

Many participants agreed iPads have enhanced student efficacy through the ease of use and customization features. *"Students are not asking how to do things; they are asking if they are allowed."* This same finding, an overall increase in self-efficacy, was also noted in the Emerge One-to-One Laptop Learning initiative. "*The key shifts in students are in technology literacy and efficacy, in their independence in learning, their increased collaboration, and their engagement in deep learning*" (Alberta Education, 2010, p. xiii).

With this ease of access, comes an increased propensity to take risks and try other ways of doing things. As one participant noted, [iPads] "*promote students perseverance...students don't seem to give up as easily [and they] lower student anxiety*". Some participants noted *"reluctant speakers are willing to talk, willing to interact more."* This may be a function of the presentation feature of iPad as students may be motivated to show others a video or app.

English language learners (ELL) are able to utilize the audio features of the iPad in innovative ways. Participants noted students are able to work individually on volume and intonation and through an *"I do we do you do"* approach become more confident English speakers. One school leader reported teachers see iPads as the perfect tool for ELLs and have shared "*Astounding stories for ELL, [and observed] rapid progress by students*".

Complex [needs] students can use iPads to represent in their "visual" language. #abedipad

Thus iPads, primarily through providing alternative ways to bridge the literacy gap to the curriculum, are meeting the needs of students challenged by text-based dependent programming. Participants stressed even the prevailing notion of disability may be based on an outdated paradigm of ability. Thus, the limitations or disabilities to access are characteristics of the medium and not the individual. "*Our students aren't "disabled," their so-called disabilities disappear when they have this technology in their hands*." A panelist

who works exclusively with students who are hard of hearing highlighted how iPads allow students to use visual images as their focus for writing and work with English or American sign language.

Two participating teachers experienced success using the *Sign 4 Me* app to facilitate communication between a deaf student and his classmates. It was the first time the deaf student was able to communicate directly with his peers.

In the movement towards inclusive learning environments, the growing need to locate resources that provide a match between students and their learning environments is profound. As one participant noted, "*communication, language and literacy needs must be served as a moral imperative."* As more is learned about human learning through disciplines such as brain-based research and complexity theory, it is perhaps time to conceive of learning in all its forms and explore ways for students to show what they know in as many ways as current technologies enable.

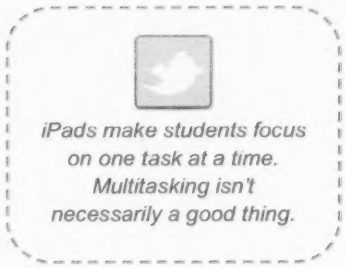
Go: Enhanced Assessments

While increased engagement and multiple ways to meet specific learning needs may be the two most readily apparent educational benefits of iPads, the potential to enhance assessment practices may well be an area for future research. Participants offered examples of how iPads supported just-in-time, formative assessments for individual students and creative approaches to summative assessment. A teacher in the UK describes how one of his students created another way to demonstrate his understanding of the water cycle. *"[My student] was recently inspired to create an animation, instead of a presentation or an essay, to explain the way the water cycle affected Greenock. Clouds and rain he had drawn emerged over photographs of Greenock, accompanied by explanatory notes"* (Belgutay, 2011, p. 15). This type of layered, multimedia assignment was also discussed by a presenter, as students in his senior high English class used the iPads to *"translate their work into other representations."* They also noted the IA Writer app, a basic word processor, only shows three lines of text and fixed width font which

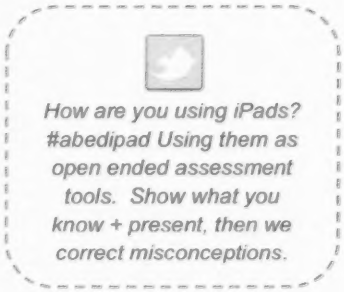
iPads supported just-in-time, formative assessments for individual students and creative approaches to summative assessment.

creates a more focused, slower approach to writing. This idea of focused attention was mentioned by others in relation to improved student learning.

Many participants emphasized the value of the audio capabilities to allow "[ELL] students to hear themselves back and self-assess" and "practice at their own pace using phonics apps." Other participants have noticed gains in language acquisition in early childhood programs. *"[We have seen] astounding success with early language [by using the] individual hearing apps with headphones."* One panelist noted iPads have been exceptionally helpful in her classroom where *"most students are not yet literate in their first language,"* the audio features allow for "*instant high quality feedback.*" In discussing language acquisition strategies, one participant mentioned that with iPads, *"I do, we do, you do becomes meaningful."*



Participants, often in reference to inclusive education practices, stressed the need to adopt a more customized approach to assessment generally since, *"success will not look the same for each student in each classroom."* iPads, largely because of the high degree of personalization inherent in the design, lend themselves to providing individualized assessment throughout the learning process. In a blog on her experience with iPad implementation, a teacher describes how she used a combination of tools to create a more differentiated approach to assessment. *"I utilized Google Forms, e-Clicker and Edmodo to not only create a faster feedback loop for assessment (allowing for same-day differentiated groupings based on exit tickets), but also allowing me to tailor assessment questions to individual students."* In these ways, iPads have the potential to support assessment *as* and *for* learning.


How are you using iPads? #abedipad Using them as open ended assessment tools. Show what you know + present, then we correct misconceptions.

Other participants discussed how they were using iPads to support summative forms of assessment by "*showcasing the progression of learning*" through "*performance-based assessments using comprehensive e-portfolios.*" Participants also shared how this ability to present student work has created a stronger connection to parents and contributed to the celebration of learning throughout the school. As one principal noted, *"the presentation element is moving our work*

forward." He discussed the advantages of using Apple TV[3] as a means of creating presentation spaces throughout the school. This same finding was evident in the Emerge One-to-One Laptop Learning initiative. "Nearly a third of Emerge teachers indicated that interactions with students' parents are "strongly facilitated by technology" (Alberta Education, 2010, p. xiv).

Working with Change: Challenges and Solutions

As noted earlier, alongside the benefits discussed throughout the day, some technical, logistical and process-oriented challenges also surfaced. Like any new technology, iPads require a new way of thinking about how work is done. As the potential of iPads is explored, the existing processes need to be reexamined and new processes may need to be adopted in keeping with the iPad's design features. The challenges discussed by participants fell into three broad categories: 1) proprietary nature; 2) workflow; and 3) device management. In what follows, these three areas are briefly outlined along with potential solutions.

Early indicators of success-teachers becoming more skilled in identifying suitable apps.

First, many participants mentioned the highly proprietary nature of Apple hardware and software (including third-party apps) as a challenge. For example, purchasing and sharing apps has been difficult, as Apple has not yet introduced a volume or bulk licensing option in Canada. In addition, finding appropriate apps has been a challenge. Apple Canada's App Store Product Usage Rules,[4] which stipulates the legal use of applications, has been interpreted in various ways resulting in a range of practices (e.g. re-gifting). Even with these rules, participants noted that there is a considerable lack of clarity regarding how devices can be populated with apps.

One presenter shared information on the iPad implementation in his school, which demonstrates some of the important considerations in using iPads school-wide. One school deployed iPads to 100 Grade 7 students, providing them with 24/7 access. There was a $60 per year insurance charge per

[3] Apple TV is a digital media receiver developed and sold by Apple Inc. that can stream content from iTunes and video from computers or iOS devices.

[4] http://www.apple.com/legal/itunes/appstore/il/terms.html

student. The school uses a cart to manage and image class sets, as well as different coloured skins to distinguish class sets. An IOS developer enterprise program called Casper helps monitor and control iPads (see all apps, clear passwords, update apps), and the students use MobileMe school-based account and iCloud.

While PCs and other technologies were designed within a managed network paradigm, iPads do not easily adapt to these environments and at times, some of the functionality relative to personalization is likely sacrificed when the fit is forced. Some examples of creative solutions generated in classrooms and at the system level were shared on the ATLE listserv after the event.[5]

> *For what it is worth there are management solutions that are developed to deploy and manage application deployment on Apple mobile devices. We will be implementing this methodology in the up and coming school year for iPads and iPhones across the district.*
>
> http://www.jamfsoftware.com/solutions/mobile-device-management/ (ATLE listserv, December 15, 2011)

One school authority has been tracking implementation practices in a few different school settings and has generated some responses to the most common questions (https://sites.google.com/a/share.epsb.ca/tips-rd/media-tablets/5-faq). At this point, school authorities are experiencing some tension as they reconcile existing infrastructure and policies with the iPad design and application management.

Second, like other technologies (e.g. laptops), iPads are most often entering classrooms as an additional resource to share between students. However, given their design, iPads 'attach' themselves to individual users by default. Parts of the reason iPads are able to offer instant accessibility is because each device stores settings and tracks usage. However, this also means in situations where a device is shared between users, some content and settings will also be shared. This can become more serious in terms of privacy protection if the content includes personal photos, e-mail messages and instant access to social media sites. So while logging on to a device or laptop takes time, it also ensures a higher degree of privacy and security.

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[5] One listserv member recommended this article on large scale deployment strategies (http://www.enterprisemobiletoday.com/features/management/article.php/3887971/iPad-Enterprise-Deployment-Guide-Everything-Mobile-IT-Needs-to-Know.htm)

Ideally, iPads work best in a one-to-one setting. As one technology director commented on the ATLE listserv after the event:

> *People in the education field looked at some of the apps and thought (rightfully so) that they would be beneficial in helping kids across the spectrum. The problem arose when we tried to do things that Apple never intended, share them* (ATLE listserv, December 16, 2011).

However, the personalized orientation of the device also creates powerful benefits as it enables differentiation. Many suggested iPads will push some school authorities toward considering personally-owned devices more closely in the years ahead. However, in most current scenarios, iPads are shared between students. One strategy identified to manage work in this case is to assign one e-mail account to each iPad and ask students to e-mail their work to their teachers or others. Some also mentioned using course management systems like Moodle, cloud-based storage such as DropBox or Google Docs. Others simply viewed the work on each iPad. There seemed to be disagreement around the effectiveness of Google docs on iPads with some participants suggesting relatively easy use and others finding it cumbersome. One participant noted that after a year of using Google Docs with netbooks, the introduction of iPads the following year essentially reduced collaboration. At this point, it is unclear how much collaboration is occurring in these environments.

Finally, largely due to the reasons outlined above, teachers have had to become more involved in the management of the devices. In the past, some teachers have come to rely on others (e.g. IT staff or a school-based technology leader) for technology support. For example, teachers have been indirectly involved in decisions regarding software selection, file management and security issues. In many districts, technology is updated and secured centrally. This type of large-scale, network structure has served to ensure common software applications, internal sharing of files and a stable, secure internal system. In most respects, then, district technology was owned, operated and maintained centrally.

In contrast, iPads are operated and maintained by users and applying a centralized model, although not impossible as outlined above, is often cumbersome. In addition, how iPads are used in classrooms is directly connected to decisions about teaching and learning. Teachers and students are becoming much more involved in ensuring the devices are managed in a way that meets their needs. This type of technology management, ranging from the selection of applications to physical storage, requires more time and shifts responsibility to users. While some participants noted this added responsibility requires more time, the majority welcomed the opportunity to be more directly involved in the decision-making regarding how iPads were utilized in their classroom. It appears iPads are fostering a resilient problem-solving culture in schools and classrooms.

The Emerge One-to-One Laptop Learning initiative documented the benefits of this same approach to implementation challenges (2010). "*Key to the progress of the Emerge one-to-one laptop implementation was the collaborative problem solving among curriculum, instruction, and technology professionals in order to tackle key issues and challenges*" (Alberta Education, 2010, p. x). Intriguingly, a growing body of research demonstrates this informal and site-based approach to implementation has other benefits in terms of fostering a culture of growth. Thus, while not a substitute for formal professional learning opportunities, a collective, problem-solving approach to implementation is proving to be highly effective in changing practice. This type of professional learning is part of a larger cultural shift in the way that people engage with learning and can instigate active engagement rather than passive consumption of information. The statement below speaks broadly to the way technologies support individual interests and build community.

> *In effect, though people perpetually explore online content and materials to learn, a final ingredient is needed to truly open education for more democratic participation and personalization. That component has to do with culture and psychology as much as technology.*

*Thus, the third macro trend electrifying all of human kind today is the creation of a culture that collaboratively builds, negotiates, and shares such knowledge and information: a participatory learning culture (*Bonk, 2009, p. 53).

Throughout the day, panelists offered examples of exactly this type of interest-driven experimentation. A few comments more strongly implied technology-focused professional development may serve to impede effective use. As one roundtable participant noted, *"know that tools do not change pedagogy [and] host no tech PD."* This idea is well-supported by emerging research on professional development which draws a connection between how teachers learn and how they practice. Simply put, if teachers attend professional development sessions or workshops that reinforce an externally-designed, stand and deliver, non-participatory type of learning environment, teachers will be less likely to enact constructivist, inquiry-based learning practices in their classrooms. However, when teachers are able to experience a more personalized approach to learning that incorporates contemporary technologies and makes authentic connections to their practice they are more likely to take up a similar approach with their students. Again the Emerge One-to-One Laptop Learning initiative similarly noted "[t]eachers need to experience and internalize 21st Century Learning if they are to transform their classrooms into 21st Century Learning Environments" (Alberta Education, 2010). In addition to the challenges and opportunities presented by the personalized design of iPads, participants also shared some emerging issues related to managing work.

In fact, the catalyst for the transformation of education, as envisioned by countless educational leaders, may lie in reimaging how teachers improve their practice in a networked age (Barab, Jackson, & Pickarsky, 2006; Bonk, 2009; Jacobsen, 2011, Randi & Zeichner, 2004; Vrasidas & Glass, 2004).

Going forward: The Next Act

Evolution Towards Individualized Learning

iPads are part of a broad social and economic shift towards personalization. Technology is one, although significant, force allowing our social world to be shaped by individual preferences. Increasingly individuals expect to be able to customize their experiences in virtually all aspects of their lives. Education exists within this larger frame and is experiencing pressure both from the public and from the research community to become more responsive to individual student learning interests and needs. iPads, as an extension of Apple's line of highly personalized products, enter the education space as a seemingly natural answer to these calls for a shift from one-size-fits-all to a custom fit. As participants highlighted, iPads allow:

- Continual access to students work and that of others, enhancing student choice of where and when to work;
- Student ownership of their learning; and
- Student involvement in selection of apps.

Concern was expressed during the day about the 'low level' of apps and warned that students may not be academically challenged but simply entertained (Twitter feed). However, others also acknowledged that as comfort with the iPads increases, teachers are becoming more discerning.

Some participants mentioned including students in the selection and many mentioned using various vetting sites, such as Diane Darrow's (http://www.edutopia.org/blog/497) or the new Bloom's taxonomy for the 21st Century (http://www.scoop.it/t/bloom-s-taxonomy-for-21st-century-learning) to aid their selection.

IEar.org great resource for finding apps

Participants also emphasized this shift in responsibilities and engagement of students in decision-making regarding technology use must be met with a more concerted focus on digital citizenship. A few participants expressed concern as the rush to adoption has resulted in a glazing over of important issues regarding privacy (e.g. *Freedom of Information and Protection of Privacy Act*), copyright and appropriate

use. Some districts have digital citizenship practices and policies in place, but participants noted the personalization of technology use in schools necessitates renewed efforts regarding digital content and safety online.

While educators have been endeavouring to differentiate instruction during the last several years, iPads are one example of a technology that allows students to make decisions regarding their learning and presentation preferences. In this way, iPads capitalize on the current potential of our networked culture. As Margaret Manning, a business owner, states, *"It's adaptive to today's digital age. You can create and consume content in a different way"* (Arthur & Fox, 2011). As noted, this potential is only realized when infrastructure is sufficient and when the classroom and school culture is open to the many ways learning can look and sound.

Indicator of success- my students teach me something new on an hourly basis

Other participants built on this idea and suggested the presentation opportunities were offering a new way to influence changes in teaching practice because rather than starting with the how-to, showcasing student work *"start[s] with the inspiration part" and "create[s] images of classrooms with effective tech infusion"* (Roundtable participant).

Create a Culture of Inquiry

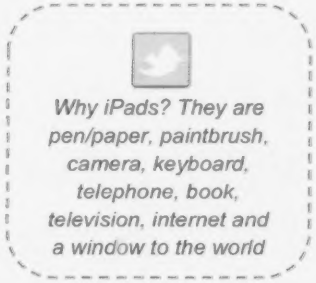
Participants offered examples throughout the day of iPads mediating communication and providing a starting point for collaboration, especially with respect to problem-solving or work-around strategies related to implementation. As one panelist noted, "[We see] *collaboration between students, the teacher becomes the facilitator. Students are also becoming the teachers."* iPads seem to be creating a culture of sharing and learning together. Interestingly, the inquiry is prompted by the challenges referred to earlier. The iPad has become something to figure out together.

"[We see] *collaboration between students, the teacher becomes the facilitator. Students are also becoming the*

Problem solving skills are developing significantly in the classrooms as students must rely on each other to come up with solutions. Students do not have access to tutorials regarding these

struggles because they are the first to experience them. Instead, students need to develop their own solutions. Students then share the solution with the rest of the class or they come up with another way to demonstrate their understanding and we make changes to the rubric together. (Panelist)

Alongside this aspect, iPads have accelerated and enhanced knowledge gathering. While some argue this demonstrates the limited functionality of the devices, others note this easy access to an array of information in many formats is valuable in the classroom. *"...it [the iPad] isn't simply a consumption device – it's an extraordinary consumption device – and the role of information acquisition in education shouldn't be under-valued"* (Gliksman, 2011). Several participants mentioned using iPads on field trips to assist in gathering information in a variety of forms. The portability and relatively long battery life of the iPads makes it easy to take to explore sites. While gathering photos or audio clips, students can also learn more about their surroundings, make observational notes and draft questions about the experience.



The creative uses of iPads are most likely to occur in environments where both teachers and students are encouraged to explore. For this reason, iPads and other highly personalized technologies require a new orientation.

Re-Frame the Approach

The idea of form determining function, or 'functional fixedness,' contributes to the notion that technologies would be used in a particular way in education. However, it is not always the actual form of the technology that is constraining but often rather the way of thinking about the educational system, the curriculum, teaching and learning that result in a perspective implementation. Thus when given a hammer, one begins to look for a nail. Koehler and Mishra (2008) argue that the repurposing of digital technologies results in enhanced utilization in the classroom and moves the education system away from perpetuating traditional (and often irrelevant) paradigms. In summing up the inevitable comparisons between laptops and iPads one participant stated, "The question is not what it can and can't do... it's a

matter of figuring out the new paradigm of HOW to do it!" This ability to take a fresh perspective and consider other ways of doing things seems to be an important disposition to adopt in working with iPads. The blog post below demonstrates how one teacher re-set her approach by focusing on the unique learning benefits of iPads. It is interesting to note, this new way of looking at her pedagogical approach came after weeks of rather lacklustre results.

> *"I also focused on the question: 'What can I do with these devices that would be impossible to do without them?' In other words, I was hoping to create new teaching methods and classroom strategies rather than replace old ones. This led to an increase in student creation. Instead of simply replacing paper math games with flashy video math games, I began to have students create their own math videos, write math blogs and conduct Challenge Based Learning math projects"* (Mageria, 2011).

This example is valuable especially in light of the tendency observed by some participants of educators to use iPads to create a purely app driven environment. Some participants expressed concern about the extensive use of apps and superficial levels of academic engagement. As electronic whiteboards have in some cases, entrenched a didactic style of instruction, there is some trepidation that app-centric iPad use could reinforce drill and practice type learning. Relying on the strong foundation of research regarding effective integration of technology will be essential going forward (Cuban, 2001; Gibson, 2008; Jacobsen, Clifford& Friesen, 2002; Nocente & Belostotski, 2009).

Final Thoughts

In combing through the comments and experiences gathered during the *iPads: What are we learning* day, several common threads regarding the benefits, challenges, unexpected outcomes and future possibilities emerged. Perhaps not surprisingly, participants have noticed iPads have increased student and teacher engagement, improved the capacity to meet a wide variety of learning needs and provided more ways for students to demonstrate their understanding. Infrastructure issues continue to present barriers often due to the proprietary nature of iPads. Participants also were finding workflow needed to be reconsidered as teachers struggled with managing student work and sharing devices. iPads have supported research-based activity both in the classroom and on field trips as they serve as data collectors, annotators, maps and communicators. In terms of educational change, the presentation ability of iPads has proven to be a powerful way to share learning and effective pedagogical practices.

Generally though, participants emphasized the importance of considering iPads as a digital resource alongside other resources and not as a solution or a replacement of other devices. Essentially, it is wise to think about iPads, or any technology, within two containers; one pedagogical and the other systemic as both shape how iPads will be utilized and influence student learning. Jurisdictions are advised to carefully consider the place of iPads within their technology plan to ensure the optimal use relative to educational goals. This discerning, holistic approach will allow educational leaders to ensure each new technology is viewed as part of a larger system of support for teachers and students (Moyle, K., 2010). iPads have become, in a relatively short time, part of our digital landscape. iPads offer unique learning benefits to students and teachers and are also contributing to a larger technology trend of personalization.

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